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thought it had lost nothing. May not this again be due to the probable fact that in successive returns the comet approaches nearer the sun, encounters more and more of the resistance of the medium, and therefore tends to develop more fully the phenomena of the tail, which would otherwise be less developed, because the nucleus must be losing some of its volatile elements?

Thus questions of interest press upon us, and astronomy, though the oldest of the sciences, is ever opening new and attractive fields of study.

METEOROLOGICAL SUMMARY FOR THE YEAR 1873.

PROF. F. H. SNOW'S ANNUAL REPORT AS METEOROLOGIST TO THE STATE
BOARD OF AGRICULTURE.

Station, Lawrence, Kansas. Latitude $38^{\circ}, 58'$; longitude $95^{\circ}, 16'$. Elevation of barometer and thermometers, 884 feet above the sea level and 14 feet above the ground; rain gauge on the ground; anemometer 105 feet above the ground, on the dome of the University building.

TEMPERATURE.

Mean temperature of the year 52.71° , which is 0.17° lower than the mean temperature of the five preceding years. Notwithstanding this very near approximation of the mean yearly temperature to the mean of past years, the range of temperature was much greater than in any previous year of our record, amounting to 130° . The extremes were 26° below zero January 29, and 104° above zero August 29 and 30. These extremes were respectively 8° lower and 1° higher than any indications of former years. Mean temperature at 7 A. M., 46.15° ; at 2 P. M., 61.80° ; at 9 P. M., 50.18° .

Mean temperature of the winter months, 26.75° (2.46° below the average); of the spring, 52.10° (1.62° below the average); of the summer, 78.06° (2° above the average); of the autumn, 53.37° (1.28° above the average).

The coldest month of the year, also the coldest month on our record, was January, with mean temperature 18.61° ; the coldest week was January 23-29, mean temperature only 2.60° above zero; the coldest day was January 28, with mean temperature 13° below zero. The night of January 28-29 was excessively cold, the mean of seven observations taken at intervals during the night being 22.5° below zero.

The hottest month of the year was August, with mean temperature 79.38° ; the hottest week was August 25–31, mean temperature 86.34° ; the hottest day was August 30, mean temperature 89.3° .

The mercury fell below zero on nine days — January 9, 10, 17, 18, 24, 28, 29, and February 1 and 2.

There were 48 days on which the mercury reached or exceeded 90° , viz.: 9 in June, 12 in July, 24 in August, and 3 in September. The mercury reached or exceeded 100° on 10 days, all of which were in August. Seven of these days were consecutive, the last seven days of the month; this continuation of intense heat being unprecedented since the record began.

The last frost of spring was April 25, this being a severe frost. The first light frost of autumn was September 8, giving a period of 136 days entirely without frost. The first severe frost of autumn was delayed until October 23, making the period of absence from severe frost 181 days. The excessive cold of the winter killed nearly every peach bud in Douglas county and a large proportion of peach trees over four or five years old. The severe frost of April 25 killed some pear, cherry and plum buds which were just coming into blossom, but left enough buds uninjured to secure an abundant crop.

RAIN.

The entire amount of rain, including melted snow, was 32.94 inches, which exceeds the rainfall of 1872 by 0.31 inch, but is less than the average rainfall of the five preceding years by 1.69 inches. Either rain or snow fell on 101 days—two less than the average number. The longest interval without rain during the growing season, March 1 to October 1, was 12 days, from July 18 to 29. The number of thunder showers was only 17; in 1872 there were 40. There was a marked peculiarity in the distribution of rain this year, giving a great excess to April, May and December, and a great deficiency to July and August. This irregularity of distribution resulted in an exceptionally abundant harvest of wheat and early potatoes, and a light yield of corn and late potatoes.

SNOW.

The entire depth of snow was $26\frac{1}{2}$ inches, distributed as follows: January, 16 inches; February, 3 inches; March, 2 inches; April, 2 inches; December, $3\frac{1}{2}$ inches. The last snow of spring was April 15; the first autumn snow was on October 27, not enough in the latter case to whiten the ground. The annual amount of snow, as given above, is 4.90 inches above the average for the five preceding years.

FACE OF THE SKY.

Average cloudiness of the year, 42.46 per cent. of the sky, which is 3.77 per cent. less than the average. The number of clear days (less than one-third cloudy) was 173; half-clear days (between one-third and two-thirds cloudy), 91; cloudy days, 101. There were 37 days without a cloud, and 29 days without a trace of sky, 10 of the latter being in December. There was not one entirely cloudy day from May 15 to November 1. August was the clearest month — mean cloudiness, 23.87 per cent.; December was the cloudiest month, the mean being 61.50 per cent. The mean cloudiness at 7 A. M. was 47.15 per cent.; at 2 P. M. 46.47 per cent.; at 9 P. M., 33.75 per cent.

DIRECTION OF WIND.

During the year (three observations daily), the wind was from the northwest 261 times; southwest, 218 times; south, 153 times; southeast, 142 times; northeast, 105 times; north, 88 times; east, 72 times; west, 35 times; calm, 21 times. The south winds (including southeast, south and southwest) outnumbered the north winds (including northeast, north and northwest) in the ratio of 513 to 454.

VELOCITY OF WIND.

The number of miles traveled by the wind was 154,508. This gives a mean daily velocity of 423.31 miles and a mean hourly velocity of 17.63 miles, the latter being 6.63 miles above the mean hourly velocity at Philadelphia. The position of the anemometer cups at an elevation of 105 feet above the ground, the most elevated point for full fifty miles in all directions, secures exposure to the full force of the wind. The maximum velocity was attained June 27, when in 22½ minutes the instrument registered 31½ miles, or at the rate of 85 miles an hour. The greatest daily velocity was 1,502 miles, November 18. The strongest winds were in March, April and November; the lightest were in July and August.

BAROMETER.

Mean height of barometer column, 29.093 inches. Mean at 7 A. M., 29.114 inches; at 2 P. M., 29.071 inches; at 9 P. M., 29.093 inches. Maximum height, 29.727 inches, at 2 P. M., February 1; minimum, 28.533 inches, at 9 P. M., April 3; yearly range, 1.194 inches. The highest monthly mean was in December, 29.199 inches; the lowest was in May, 28.947 inches. The barometer observations are corrected for temperature, but not for elevation, in accordance with the rules of the Smithsonian Institution.

RELATIVE HUMIDITY.

Mean for the year, 64.06; at 7 A. M., 75.14; at 2 P. M., 45.77; at 9 P. M., 71.28. The dampest month was December, humidity 76.38; the driest month was March, humidity 52.88. On the 28th, 29th and 30th of March the air was exceedingly dry, the percentage of moisture at 2 P. M. on the latter date sinking to 3.8, or less than one twenty-fifth of the amount required for saturation. There were only six fogs during the year.

FORCE OF VAPOR (IN INCHES.)

Mean for the year 0.308; at 7 A. M., 0.302; at 2 P. M., 0.300; at 9 P. M., 0.321; greatest, 0.983 at 2 P. M., July 5; least, 0.012 at 7 A. M. January 29; highest monthly mean in June, 0.619; lowest in January, 0.091.

The following table gives the mean temperature, the extremes of temperature, relative humidity, and rainfall for each month of the year 1873; also a comparison with preceding years :

Month.	Mean Tempera- ture.	Max'm Tem- perature.	Min'm Tem- perature.	Relative Humidity.	Rainfall in Inches.
January.....	18.61	46.5	-26.0	75.57	2.66
February.....	30.26	62.0	-6.5	68.15	0.86
March.....	42.81	74.0	4.0	52.88	1.34
April.....	48.85	88.0	26.0	63.44	4.42
May.....	64.64	88.5	46.0	68.93	7.12
June.....	76.90	97.0	58.0	68.04	2.96
July.....	77.90	97.0	62.5	64.36	2.38
August.....	79.38	104.0	56.0	57.87	0.90
September.....	66.25	94.0	36.0	59.96	3.75
October.....	51.23	83.0	16.5	57.83	0.92
November.....	42.58	78.0	12.0	55.40	1.24
December.....	31.37	67.5	9.0	76.38	4.39
Year 1873.....	52.71	104.0	-26.0	64.06	32.94
Year 1872.....	51.90	97.0	-18.0	64.40	32.63
Year 1871.....	54.30	103.0	-6.0	33.23
Year 1870.....	54.50	102.0	-10.0	68.40	31.38
Year 1869.....	50.36	96.0	-5.0	38.51
Year 1868.....	53.36	101.0	-16.5	37.42